



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,872	06/24/2003	Won-Bong Choi	030681-521	1325

21839 7590 07/19/2006

BUCHANAN, INGERSOLL & ROONEY PC
POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER

YUAN, DAH WEI D

ART UNIT	PAPER NUMBER
----------	--------------

1745

DATE MAILED: 07/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

5

Office Action Summary	Application No. 10/601,872	Applicant(s) CHOI ET AL.	
	Examiner Dah-Wei D. Yuan	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 May 2006.
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 13-30 is/are pending in the application.
 4a) Of the above claim(s) 17-30 is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-4, 13-16 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1745

**CARBON NANOTUBES FOR FUEL CELLS, METHOD FOR MANUFACTURING THE
SAME, AND FUEL CELL USING THE SAME**

Examiner: Yuan

S.N. 10/601,872

Art Unit: 1745

July 12, 2006

Detailed Action

1. The Applicant's amendment filed on May 22, 2006 was received. The specification was amended. Claims 1,4 were amended. Claims 17-30 were added.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on February 21, 2006.

Election/Restrictions

3. Newly submitted claims 17-30 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The subject matter of aforementioned claims is an electrode for a fuel cell as classified in class 429, subclass 40, which is distinct from the "carbon nanotubes", classified in class 423, as recited in the original claims.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 17-30 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 102/103

4. Claims 1-4,13-16 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Dodelet et al. (US 6,887,451 B2).

With respect to claims 1,3, Dodelet et al. teach carbon nanotubes which are grown over a carbon paper carrying nanosized catalyst. See Column 2, Line 34 to Column 3, Line 17. As disclosed in the instant specification, the use of hydrogen gas can convert metallic catalyst particles in oxidized form into reduced form, thereby increasing the activity of the catalyst particles and lead to the growth of branched carbon nanotubes. See page 6, lines 8-10. Dodelet et al. similarly teach the use of hydrogen in the gaseous mixture to fabricate carbon nanotubes. Therefore, the formation of some branched carbon nanotubes in the final MWCNTs would have been essentially certain.

Furthermore, Dodelet does not specifically disclose the loading of the catalyst on the nanotubes. However, it is the position of the examiner that such properties of said material are inherent, given that the nanotubes disclosed by Dodelet et al. and the present application having similar chemistry and preparation procedure. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities. In re Robertson, 49 USPQ2d 1949 (1999). Alternatively, it would have been obvious to one of ordinary skill in the art to adjust the catalytic concentrations of the nitrate salts (from 0.15 to 1.0 M) in order to provide desirable concentration of the nano-sized catalyst between 0.3-5 mg/cm².

In addition, it is the position of the examiner that disclosure provides no evidence of criticality with regard to the concentration of the catalyst particles.

With respect to claim 2, Dodelet et al. teach the use of catalysts including Fe, Co and Ni, which can serve as catalysts for carbon nanotube growth and fuel cells. See Column 3, Lines 23-29; Column 4, Lines 31-36.

With respect to claim 4, it is the position of the examiner that such properties of said material are inherent, given that the nanotubes disclosed by Dodelet et al. and the present application are prepared by the same procedure, i.e., chemical vapor deposition.

With respect to claims 13-16, Dodelet et al. teach the use of nanotubes as the electrodes for fuel cells. See Column 1, Lines 9-17.

Response to Arguments

5. Applicant's arguments filed on May 22, 2006 have been fully considered but they are not persuasive.

Applicant's principle arguments are

Dodelet expressly states that its nanotubes are quite straight, which clearly indicates they are not branched.

In response to Applicant's arguments, please consider the following comments.

Dodelet et al. teach in some instances that normally straight nanotubes suddenly become curved and change their structure at their tips when they become tortuous when the growth

temperature suddenly dropped at the end of the growth session. See Column 4, Lines 5-29. This indicates the tortuous nature at the tips of the nanotubes that extend from the main body of the MWCNTs into branches.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295. The examiner can normally be reached on Monday-Friday (8:00-5:00).

Art Unit: 1745

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dah-Wei D. Yuan
July 12, 2006



DAH-WEI YUAN
PRIMARY EXAMINER